1. Amendments to the Claims:

A listing of the entire set of pending claims (including amendments to the claims, if any) is submitted herewith per 37 CFR § 1.121. This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1. (Currently amended) ~~In~~ A method for correcting impairments on information, passing through an information transmission system, ~~comprising~~ imposed by a plurality of defective elements of the information transmission system for generating, transporting, and receiving the information, ~~wherein some elements are defective and impose impairments on~~ the ~~information passing therethrough, a~~ method ~~for correcting said impairments,~~ comprising:

~~a)~~ identifying the defective elements imposing impairments on the information and characterizing ~~the~~ each defect ~~of each, including~~ by performing a frequency analysis of each defective element;

~~b)~~ determining ~~a correction characteristic corresponding to each defective element, and creating~~ a frequency characteristic complementary to said frequency analysis, such that ~~the~~ a combination of said frequency analysis and said complementary frequency characteristic ~~along with the correction characteristic~~, when applied to information passing through said element, corrects the impairment imposed by said element; and

~~c)~~ creating a composite, two channel I and Q finite impulse response filter, having I-I and Q-Q direct components and I-Q and Q-I cross components, by combining said ~~correction~~ complementary frequency characteristics~~, and performing an inverse discrete Fourier transform of said complementary characteristic; and g) positioning~~, said filter being positioned in said information transmission system for correcting said impairments imposed on the information by said defective elements.

2. (Currently amended) ~~An information transmission system, as in~~ The method of claim 1, wherein said system is ~~limited to~~ a data receiver ~~whose~~ and said plurality of elements include an IF filter, a two-channel down-converter, and I and Q data processing channels.

3. (Currently amended) ~~An information transmission system, as in~~ The method of claim 1, wherein said system is ~~limited~~ to a data generator ~~whose~~ and said plurality of elements include I and Q data channels, a two-channel up-converting modulator, and an IF filter.

4. (Canceled)

5. (Currently amended) ~~An information transmission system, as in~~ The method of claim 1, wherein:

~~i. step (c) further~~ creating a composite, two channel I and Q finite impulse response filter includes arranging said direct and said cross components as terms of a set of 2x2 matrices~~; and~~

~~ii. step (d) further includes arranging said single correction characteristic as terms of a set of 2x2 matrices~~.

6. (Currently amended) A generalized digital filter for filtering two-component signal information of a receiver comprising a plurality of receiver elements, the filter comprising:

~~a)~~ a dual input port, having an I input for a signal x_I and a Q input for a signal x_Q, wherein x_I and x_Q are components of a two-component input signal x;

~~b)~~ a dual output port, having an I output for a signal y_I and a Q output for a signal y_Q, wherein y_I and y_Q are components of a two-component output signal y;

~~c)~~ a first signal path, characterized by a first impulse response, having an input

coupled to the I input port and a first output;

~~d)~~ a second signal path, characterized by a second impulse response, having an input coupled to the Q input port and a second output;

~~e)~~ a third signal path, characterized by a third impulse response, having an input coupled to the I input port and a third output;

~~f)~~ a fourth signal path, characterized by a fourth impulse response, having an input coupled to the Q input port and a fourth output;

~~g) summing means~~ a first adder for adding said first and second outputs and for coupling the sum thereof to said I output; and

~~h) summing means~~ a second adder for adding said third and fourth outputs and for coupling the sum thereof to said Q output,

wherein said first, second, third and fourth impulse responses provide frequency compensation for impairments imposed by a plurality of defective elements among the plurality of receiver elements.

7. (Currently amended) ~~A~~ The generalized digital filter, as in claim 6, wherein said first, second, third, and fourth impulse responses are independent of one another.

8. (Currently amended) ~~A~~ The generalized digital filter, as in claim 7, wherein said first, second, third, and fourth impulse responses are further constrained to have finite lengths.

9. (Currently amended) ~~A~~ The generalized digital filter, as in claim 8, wherein said first, second, third, and fourth impulse responses are further constrained to have equal lengths.

10. (Currently amended) ~~A~~ The A generalized digital filter, as in claim 6, wherein said first, second, third, and fourth signal paths are realized by finite impulse-response filters.

11. (Currently amended) ~~A~~ The generalized digital filter, as in claim 10, wherein each of said finite impulse-response filters is independently characterized.

12. (Previously Presented) In applying a generalized two-channel digital filter to process an input data stream x and to produce an output data stream y, wherein both x and y are two-component signals x_I, x_Q, y_I, and y_Q which are processed in blocks of N/2 data values long, N being a power of 2, and wherein the filter is characterized by four independent impulse response vectors h_{11}, h_{12}, h_{21}, and h_{22}, each vector of length N/2, a method for efficiently computing said output data stream y, comprising the preliminary steps of:

a) forming the vectors

$$a = \frac{(h_{11} + h_{22}) + j(h_{21} - h_{12})}{2} \quad \text{and} \quad b = \frac{(h_{11} - h_{22}) + j(h_{21} + h_{12})}{2}$$

b) appending N/2 zeros to each vector and performing an FFT on each vector to produce A_k and B_k, respectively; and, for each block of N/2 data values in said input data stream x, additionally comprising the iterative steps of:

c) moving the previous block of input data values to the first half of an input vector x_N of length N and loading the current block of input data values into the second half of said input vector x_N;

d) treating x_N as a vector of complex numbers of the form $x_I + jx_Q$, and performing a N-point FFT to produce X_k;

e) computing the complex vector $Y_k = A_k X_k + B_k X_{N-k}$, $0 \leq k < N/2$, and performing an inverse FFT on the result to produce the complex vector y_n;

f) designating the second half of y_n as the N/2 output samples of the current iteration, according to $y_{In} = \text{Real}(y_Q)$, $y_n = \text{Imag}(y_n)$, where $N/2 \leq n < N$; and

g) returning to step (c) for the next block of N/2 data values.